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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/590,206	08/22/2006	Shu Kobayashi	1680/55	5091
25297 7590 01/21/2011 JENKINS, WILSON, TAYLOR & HUNT, P. A. 3100 Tower Blvd. Suite 1200 DURHAM, NC 27707				
EXAMINER				
BERNS, DANIEL J				
ART UNIT		PAPER NUMBER		
1734				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary**Application No.**

10/590,206

Applicant(s)

KOBAYASHI ET AL.

Examiner

DANIEL BERNIS

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Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 November 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☒ Claim(s) 4 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 August 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-845)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Objections

2. Claim 4 is objected to because of the following informalities: "clusters is" must be changed to "clusters are" therein for grammar reasons. Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 3 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The limitation "the aromatic groups" therein lacks a sufficient antecedent basis.
5. Claim 11 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Said claim describes monomers A1 and B1 from claim 10. However, monomer A1/B1 is optional, in that claim 10 (from which claim 11 depends) can be satisfied by the presence of only monomers B2 and B3. To the extent that monomer A1/B1 is not required by claim 10, claim 11 is without sufficient antecedent basis and thus rejected as indefinite.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1-3 and 5-12 are rejected under 35 U.S.C. 102(b) as being anticipated by Akiyama et al.'s 2003 JACS article ("JACS"). Regarding claim 1, JACS discloses a polymer-supported metal cluster composition comprising a transition metal supported by a cross-linked polymer, said polymer being formed by cross-linking a cross-linkable polymer having both hydrophobic and hydrophilic side chains with cross-linkable functional group(s) thereon. See JACS at p. 3412, col. 1; Fig. 1. While JACS does not explicitly disclose that its transition metal is in cluster form, this limitation may reasonably be thought implicit/inherent to JACS, since the metal is in ligand-free form (ligand-bound transition metals would imply a single or definite number of metal atoms per complex; clusters of metal atoms is thus conversely implied in the absence of ligands). See *id.* at p. 3412, col. 1, 3rd par.

Regarding claim 2, JACS' composition is produced within solution by forming metal cluster-supporting micelles (aka "microcapsules") of cross-linkable polymers, and then cross-linking said polymers. See *id.* at p. 3412, col. 1.

Regarding claim 3, JACS' micelles/microcapsules are formed as claimed (the metal is transferred from PPh₃ ligands to the cross-linkable polymers, presumably to the aromatic groups therein). See *id.*

Regarding claims 5-7, JACS' transition metal is Pd⁰. See *id.* at p. 3412, col. 1, 3rd par.

Regarding claims 8 and 9, JACS' cross-linkable polymer contains hydrophilic side chains having epoxy and hydroxyl groups. See *id.* at Fig. 1.

Regarding claim 10, JACS' cross-linkable polymer is a copolymer obtained by copolymerizing monomers such as a monomer with an aromatic, hydrophobic side chain and a

polymerizable double bond, and a monomer with a hydrophilic side chain having a cross-linkable functional group and a polymerizable double bond. See *id.* at p. 3412, col. 1, 3rd par.; Fig. 1.

Regarding claim 11, JACS discloses structures such as those claimed. See *id.* at Fig. 1.

Regarding claim 12, JACS employs its composition in reactions such as hydrogenations. See *id.* at, e.g., Table 1.

Claim Rejections - 35 USC § 102/103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

10. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the Examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the Examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

11. In considering the obviousness rejections below, the applicant should note that the person having ordinary skill in the art at the time of the invention has the capability of understanding the scientific and engineering principles applicable to the claimed invention. The references of record in the application reasonably reflect this level of skill.

12. Claims 1-12 are rejected under 35 U.S.C. 102(b) as being anticipated by or, in the alternative, under 35 U.S.C. 103(a) as being unpatentable over JACS. Regarding claims 1-3 and 5-12, JACS' teachings are as above. Regarding claim 4, JACS' composition is produced within solution by forming metal cluster-supporting micelles (aka "microcapsules") of cross-linkable polymers, and then cross-linking said polymers. See *id.* at p. 3412, col. 1. The difference between claim 4 and JACS is that the latter fails to explicitly teach ≤ 20 nm metal cluster diameters.

Nevertheless, said diameter value would have been an inherent and/or obvious feature of the formed metal clusters to one of ordinary skill in the art at the time the invention was made, since both JACS' metal clusters and those within the claim were produced by identical or at least substantially similar processes. See *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977) (holding that where claimed and prior art products are produced by identical or substantially similar methods, a *prima facie* case of anticipation or obviousness has been established); MPEP 2112.01.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DANIEL BERNS whose telephone number is (571)270-5839. The examiner can normally be reached on Monday thru Thursday, 9AM-6PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Emily Le can be reached at (571)272-0903. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

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applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/D. B./ January 11, 2011
Examiner, Art Unit 1734

/Timothy C Vanoy/
Primary Examiner, Art Unit 1734